



I-TEAM BRIEF



The Innovation Team (I-Team) at the Caltrans Division of Research and Innovation, in cooperation with its partners, develops proven, ready-to-deploy innovations in methods, materials, and technologies that enable Caltrans to provide the most effective management of public services, resources, and infrastructure.

JUNE 2010

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DIVISION OF RESEARCH AND INNOVATION

Rapid Rehab

A powerful decision-making tool for design, construction, and traffic engineers

Highway maintenance and rehabilitation activities often cause congestion, introduce safety concerns, and require lengthy lane closures. DOTs face the challenge of providing the needed level of service and safety, both for the traveling public and for workers in work zones, while minimizing disruptions for local communities and adjacent businesses. Current practices to develop designs, construction schedules, and traffic management options are limited and time consuming. **The Caltrans I-Team supported research that developed and implemented a highly efficient schedule and traffic analysis software tool.**

READY TO DEPLOY

Rapid Rehab, formerly called CA4PRS, is a robust schedule and traffic analysis tool that aids planners and designers by determining the most efficient and economical highway rehabilitation or reconstruction strategies. It can quantify the impact of work zone closures in terms of traffic delay time and user cost, taking into account alternative pavement designs, lane-closure tactics, and contractor logistics.

NEW AND IMPROVED

- Shortens the time required for engineers to develop designs, construction schedules, and traffic management options.
- Provides a design tool that results in improved construction staging and more effective traffic management plans.
- Increases the number of “what if” scenarios engineers can evaluate.
- Performs the majority of the analyses required to comply with the Federal Highway Administration (FHWA) rule governing safety and mobility in work zones.
- Reduces delays for roads carrying high passenger volumes in urban locations as well as those carrying heavy freight on rural routes.

Use of Rapid Rehab on the I-15 Devore concrete pavement rehabilitation project (below) saved \$6 million in construction costs and significantly reduced delays.



About Rapid Rehab

Rapid Rehab was developed by Dr. E.B. Lee, a researcher at the University of California Pavement Research Center (UCPRC), part of the Institute of Transportation Studies at the University of California, Berkeley. Caltrans, and the DOTs of Florida, Minnesota, Texas, and Washington provided major support. The University of California, Berkeley owns the copyright. Caltrans and 20 U.S. states currently hold unlimited licenses; engineers at licensed DOTs can download the software for free. The software was originally called CA4PERS and was renamed "Rapid Rehab" in 2009.



GET STARTED

Join our mailing list so we can notify you about the next available training.

Contact:

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Download the free software at <http://www.dot.ca.gov/researchroadway/ca4prs/>

Learn More

Caltrans Web Page:

<http://www.dot.ca.gov/newtech/roadway/ca4prs/index.htm>

Additional Resources:

- <http://www.fhwa.dot.gov/crt/lifecycle/ca4prs.cfm>
- <http://www.fhwa.dot.gov/publications/focus/08oct/01.cfm>
- <http://www.fhwa.dot.gov/publications/publicroads/07jan/05.cfm>
- <http://tig.transportation.org/Documents/CASTCloseoutReport.pdf>



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SUCCESSES

- Endorsed by Federal Highway Administration (FHWA) as Market Ready Technology in 2009.
- The FHWA funds state licensure; 20 states have purchased licenses thus far.
- Won 2007 International Road Federation Global Achievement Award for Research.
- Selected as 2006 Focus Technology by the Technology Implementation Group (TIG) of the American Association of State Highway Associations (AASHTO).
- Won two Caltrans 2005 Excellence in Transportation Awards.

METRICS

- **Realized \$13 million in savings** on adopted projects.
- **Estimated \$29.3 million in savings** on partially adopted and pending projects.
- 1-15 Ontario project (D8) began construction in 2009 and saved \$5 million, or 8.4%, over the initial design costs by partially adopting Rapid Rehab recommendations.
- US-101 San Jose (D4) saved \$3 million, or 6.3%, over the initial design costs by partially adopting Rapid Rehab recommendations.

GET READY

Rapid Rehab is free and suitable for most current Windows desktop environments:

Training: Caltrans offers hands-on 2.5-day training

Software: Free to all licensed state DOTs including Caltrans. (FHWA funding available for licensure.)

Hardware: The software tool resides on a desktop computer, running standard Microsoft Windows 95/NT4/098/2000/XP or higher operating systems.

Status Summary of Rapid Rehab (formerly CA4PRS) Implementation Projects

Route	Location	Type	Project Cost	Estimated Cost Savings*	Length	Year Begin Const.	Implementation Status**
I-10	Pomona, D7	Rehab	\$16M	\$0.3M	1 mile	2000	Partially adopted
I-710	Long Beach, D7	Rehab	\$17M	\$1M	5 miles	2003	Adopted
I-15	Devore-I, D8	Rehab	\$16M	\$8M	3 miles	2005	Adopted
I-15	Devore-II, D8	Rehab	\$24M	\$4M	5 miles	2007	Adopted
I-15	Ontario, D8	Rehab	\$59M	\$5M	8 miles	2009	Partially Adopted (Ongoing)
I-280	Santa Clara, D4	CAPM	\$20M	\$2M	6 miles	2009	Not adopted
US-101	San Jose, D4	CAPM	\$47M	\$3M	7 miles	2009	Partially adopted (Ongoing)
I-680	San Ramon, D4	Rehab	\$70M	\$1M	12 miles	2010	Partially Adopted (Upcoming)
US-101	Ukiah, D1	CAPM	\$19M	\$2M	6 miles	2010	Not adopted
I-5	Redding, D2	Rehab	\$50M	—	14 miles	2011	Pending
I-80	Sacramento, D3	Widening & Rehab	\$92M	\$5M	9 miles	2011	Pending
I-5	Sacramento, D3	Rehab	\$92M	\$15M	17 miles	2011	Pending

* Estimated cost savings by adopting the alternatives recommended by Rapid Rehab X2 assessment as compared with project initial design.

** Adopted, partially adopted, or not adopted: the project team decided fully, partially, or not to implement Rapid Rehab X2 recommendations into the project considering other circumstances and constraints.